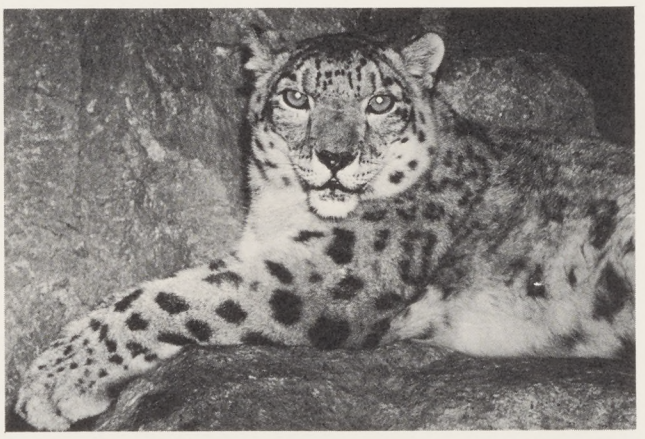
CRES REPORT

The Center For Reproduction of Endangered Species

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clouded leopard

TREATING INFERTILITY: CRES EMPLOYS INNOVATIVE METHOD

A novel strategy to enable otherwise infertile exotic animals to become pregnant has been initiated at The Center for Reproduction of Endangered Species. Small pumps, purchased from the Alza Corporation and adapted for this use at the San Diego Zoo, are implanted in animals as a means to release a special hormone into the system to stimulate ovulation.

From Women's Waists to Animals' Shoulders

Typically, when we think of medical breakthroughs, we think of lessons learned on animals being applied to humans. With this innovative program, CRES researchers have turned the tables.

Since the early 1970s, the hormone GnRH has been used successfully to treat one kind of infertility—anovulation—in women. The hormone must be administered in repetitive doses over a period of several days, so the patient wears a mechanical pump on a belt around her waist, and the pump dispenses a predetermined amount of GnRH at preset intervals.

While a portable pump worn around the waist has been a practical means to treat women, it is not a realistic therapeutic strategy for animals, as they're prone to scratch or chew at an annoyance. How, then, to take advantage of the proven effectiveness of GnRH in order to enhance the fertility of exotic animals?

A research team spearheaded by Endocrinologist Dr. Bill Lasley at the Zoo collaborated last year with veterinarians at the University of California at San Diego. The team tested the use of GnRH in dogs in a laboratory setting. Portable pumps were used and were tolerated by the dogs, and the use of the hormone proved promising. The success of this preliminary research effort then led the team members to the current approach which uses implantable pumps rather than portable pumps in exotic species.

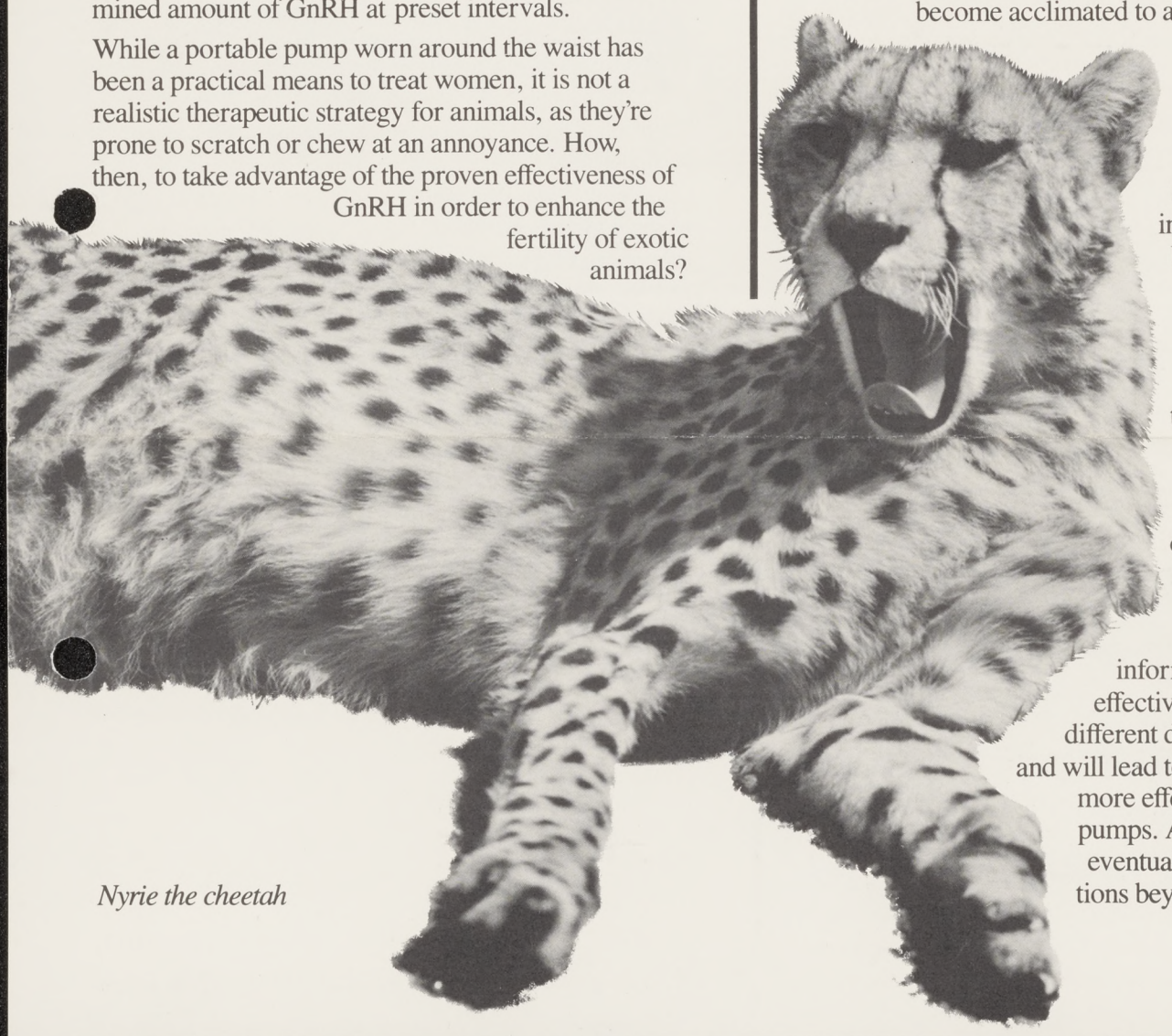
Slightly smaller than your thumb, the pumps are implanted just under the skin of the animal's shoulder. The hormone then can be administered in preset quantities, at regular intervals, for up to one month without the animal even being aware of the pump or the treatment.

Hormone Therapy Without Stress

This highly practical therapeutic strategy reduces the stress associated with repetitive treatments and allows for the therapy to be delivered while the animal follows a virtually normal routine. Mating behavior and ovulation can be anticipated to occur at some fixed time period after the pump has been implanted, the therapy has begun and the animal has become acclimated to a new mate and/or environment.

Grant for Further Study

In May, a grant submitted by Dr. Lasley in collaboration with UCSD and Cornell University was funded by the National Institutes of Health. Under this grant, a two-year study is being conducted to test the administration of GnRH by portable pumps attached to dogs. These studies will provide new information relating to the effectiveness of GnRH at different doses and frequencies and will lead to the development of more effective implantable pumps. Although such pumps eventually may have applications beyond delivering drugs



Nyrie the cheetah

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to regulate reproduction, this effort will concentrate on their utility in delivering GnRH to control fertility.

Since ovulation induced by GnRH frequently leads to pregnancies in women and dogs, scientists believe that similar results ultimately will be achieved in exotic animals once the implantable pumps are applied to the appropriate situations.

Thus the research is considered to be a key step toward reaching CRES' primary goal of establishing reproductively self-sustaining groups of endangered species.

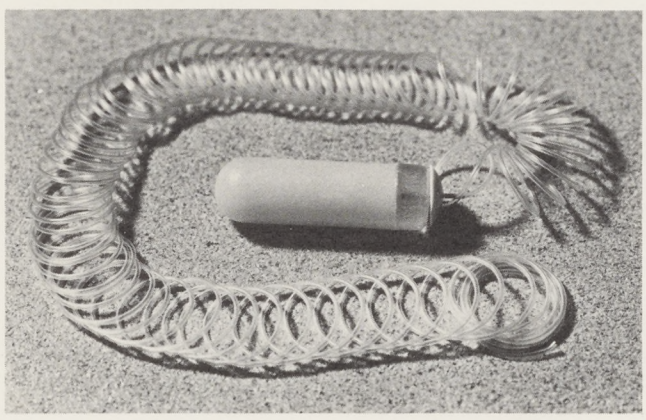
Nyrie: A Proud Parent

During several months prior to obtaining the NIH grant, Dr. Lasley's team tested the implantable pumps in 15 cases including such non-domestic animals as a clouded leopard, cheetahs, rhinos, servals (African cats), and a golden cat. At least eight of the animals experienced ovulation, while only one – a cheetah named Nyrie – was allowed to mate with a proven male at the time of the treatment.

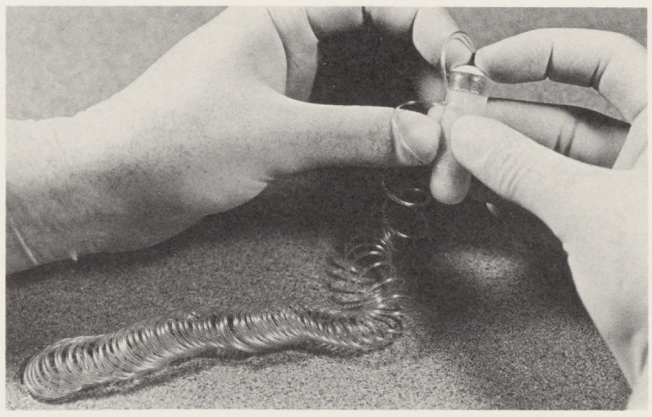
Infertile since early 1982, Nyrie began to receive GnRH via the tiny pump inserted in her shoulder in late January. On March 26, she began to show unusual signs of interest in a near-by male, and she was paired with him on March 27 and 28.

As this issue of *CRES Report* went to the printer, our veterinarians confirmed the joyous news: Nyrie is pregnant with twins, and delivery is expected late this month.

Small Miracles



An interesting sidelight is that the implantable pumps used in this research are custom-modified in the Zoo's endocrine laboratory. Amy Wing spends between six and eight hours working on each tiny pump. She painstakingly adapts each one so that instead of providing a constant infusion of GnRH, it will supply the hormone in pulses of about 10 minutes every three hours.



First Amy coils 14 feet of extremely thin tubing (such as is used for IV therapy) around the outside of the little pump. Into this tubing she injects alternating units of sterile peanut oil and a nearly microscopic amount of GnRH. Once the pump is implanted in an animal, it works by osmosis to deliver the fluid from the tubing into the animal's system. Inside of the pump is a device resembling a balloon. As body fluids are taken into the pump, they squeeze the balloon, which in turn squeezes out the fluid from the tubing.

Team Effort

Our efforts to produce offspring in otherwise barren female animals have involved several collaborators whose assistance has been extremely valuable. Special recognition should go to the University of California at Davis, Texas A & M, National Zoo and our own veterinarians. GnRH has been provided by Dr. Jean Rivier from the Peptide Laboratory at the Salk Institute.